Asia-Pacific Forum on Science Learning and Teaching, Volume 10, Issue 2, Article 13, p.1 (Dec., 2009)
Hakan TURKMEN
Examining elementary science education teachers disposition after reform

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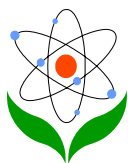**Bornova, Izmir 35100, TURKEY**

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Abstract

The purpose of study was to examine the disposition of in-service teachers at the primary level. 412 science teachers from 72 primary schools, participated by filling out the "Teacher Disposition Index" questionnaire. After factor analyzing the data, Turkish in-service teachers did not fail, but they had doubts in some disposition skills. They were not sure how to maintain and develop their professional skills.

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They were not seeking out professional growth opportunities, especially in regard to keeping up with current research on teaching practices. Moreover, they had ethical and communication problems with students and parents and their colleagues. Finally they had difficulties selecting proper (relevant and interesting for students) materials for lessons. The most probable reason for these problems is that in-service teachers do not know students both formally (pedagogically) and informally.
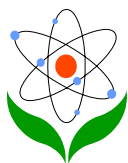
Keywords: Disposition, Effective teacher, Teacher quality

Introduction

Teaching is one of the most important jobs in society. Good teachers will create better people for the future because teachers shape many ideas that students hold about the world and their own future. Large numbers of new teachers enter our schools every year. With the implications of recent technology and science education reform. politicians and educators have been planning to make improvement in schools since the 1990's. The recent Turkish science education reform declared that students should become scientifically literate. From primary school through university, students need not only develop a basic understanding of the concepts underlying science, but must also gain a sophisticated understanding of the assumptions and values inherent in the development of those ideas (Yilmaz. Turkmen. & Pedersen. 2008). To execute this, teachers are the most important factor in improving schools. Teacher preparation programs have a significant effect on teacher quality. Briefly we can say that teacher quality depends on the areas of content knowledge. pedagogical skills and disposition (Collinson, Killeavy & Stephenson, 1999; Darling-Hammond, 1997). We, as educators, have had experience in effectively assessing a person's knowledge and behavior. Disposition, on the other hand, is more difficult to measure. Numerous studies have grappled with the definition of disposition and have searched for a venue where an effective assessment of a teacher's dispositions could be best evaluated.

Teacher disposition effective teaching

Teaching is not just passing knowledge to students, there is so much more involved. Teachers need to not only know the material very well but also be aware of effective ways to transfer knowledge. When we recall our own school days, we remember the best and worst of our teachers and the impact these teachers had on our lives. Teachers whose ability to motivate, encourage, understand and care

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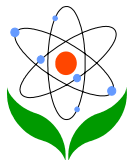Examining elementary science education teachers disposition after reform

inspired students and provided a positive school experience which in turn contributed to students' success in their later lives. Other teachers who were unable to do these things made school a negative and unproductive experience for their students.

According to the Thorndike-Barnhart Dictionary dispositions are defined as qualities that characterize a person as an individual; the controlling perceptual (mental, emotional, spiritual) qualities that determine the person's natural or usual ways of thinking and acting. Meanwhile, there are many definitions of disposition in the literature. Katz (1993) defined a disposition as "a pattern of behavior exhibited frequently and in the absence of coercion, and constituting a habit of mind under some conscious and voluntary control. and that is intentional and oriented to broad goals" (p. 10). The National Council for Accreditation in Teacher Education (NCATE. 2000) defined dispositions as referring to the values, commitments and professional ethics that influence behaviors toward students, families, colleagues and communities and affect student learning, motivation and development, as well as the educators' own professional growth. In the NCATE Professional Standards document states, "dispositions are not usually assessed directly: instead they are assessed along with other performances in candidates' work with students, families and communities" (NCATE, 2001, p.19). Ritchhart defines dispositions in his book Intellectual Character (2002) as:

"Acquired patterns of behavior that are under one's control and will as opposed to being automatically activated. Dispositions are overarching sets of behaviors, not just single behaviors. They are dynamic and idiosyncratic in their contextualized deployment rather than prescribed actions to be carried out. More than desire and will, dispositions must be coupled with requisite ability. Dispositions motivate, activate, and direct our abilities" (p. 31).

Dispositions are guided by beliefs and attitudes related to values such as caring, fairness, honesty, responsibility, and social justice. Combs (1999) listed the five areas of belief that discriminated clearly between good and poor helpers were (1) beliefs about the significant data: Good helpers are people oriented; they are sensitive or empathic; (2) beliefs about people: Good helpers hold more positive beliefs about the people with whom they work; (3) beliefs about self: Good helpers hold positive beliefs about themselves; (4) beliefs about purposes or priorities: Good helpers hold beliefs about purposes that are more people oriented. broader and deeper, and concerned with freeing rather than controlling; (5) beliefs about personal openness: Good helpers hold beliefs that allow them to be more

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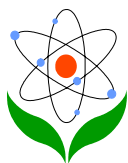Examining elementary science education teachers disposition after reform

self-revealing than self-concealing. They are characterized by authenticity in their beliefs.

Many researchers have defined how effective a teacher should be. The recent focus on disposition draws heavily from research on the characteristics of effective teachers (Good & Brophy, 1997; Leithwood, 1990; Stanford, 2001). However, there is a shift away from emphasizing content and pedagogical knowledge toward inter- and intra-personal knowledge and skills of effective teachers (Collinson. 1996). While the shift seems intimidating, "it is important for teacher educators to know and understand the dispositions of effective teachers. so as to design experiences that will help to develop these characteristics in students and to help students discover if they have the dispositions to teach" (Taylor & Wasicsko, 2000, p. 2). To identify dispositions of effective teachers there has been an examination of research on effective teaching.

Good and Brophy (1997) identified 10 teacher behaviors that show a positive relationship to student performance. The first five, referred to as key behaviors, are lesson clarity, instructional variety, teacher task orientation, engagement in the learning process, and student success rate, which are all regularly supported by research studies. The second five are, identified as helping behaviors, which serve as catalysts for implementing the following five key behaviors: student ideas and contributions, structuring, questioning, probing and teacher affect. These behaviors have some support and are logically related to effective teaching, although additional studies are necessary to identify clearly how these behaviors should be used. Similarly, Cotton (1995) described effective teachers as those who have clear standards for classroom behavior and clear and focused instruction, effective questioning techniques, providing feedback, using a variety of assessment strategies, and having positive interactions with their students and a caring disposition.

In 1996, Collinson asked outstanding teachers to identify characteristics of effective teachers. Three types of knowledge, intrapersonal, interpersonal, and professional, were identified from the outstanding teachers' responses. With regard to intrapersonal knowledge, outstanding teachers consistently mentioned that effective teachers displayed care and compassion and respect to themselves and others. Specific to interpersonal knowledge, exemplary teachers were reflective, showed respect to themselves and others and displayed courage. In the professional knowledge category, teachers indicated a disposition toward continuous learning, curiosity, creativity, flexibility and pride in their efforts.

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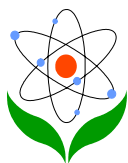Examining elementary science education teachers disposition after reform

Ushers identified five important characteristics of effective teachers. The first one is empathy; seeing and accepting the other person's point of view and respecting and accepting each person's own unique perceptions. The second is a positive view of others; believing in the worth. ability and potential of others and seeing other people in essentially positive ways. This approach gives others the feeling that they can and will rather than that they can't or won't. Third, disposition is positive view of self; believing in the worth, ability and potential of oneself, and seeing oneself as essentially dependable and capable, thus making one accepting of inadequacies. Fourth, disposition is authenticity; feeling a sense of freedom and openness that enables one to be a unique person in honesty and genuineness, and seeing the importance of openness, self-disclosure and being real as a person and teacher. Finally, a meaningful purpose and vision are important; committing to purposes that are primarily person-centered, broad, deep, freeing and long range in nature and seeing the importance of being visionary and reflective as a teacher contribute to this disposition (Usher, Usher & Usher, 2003).

Partington et al. (1997) stated that typical students' comments on successful teachers included: teachers who encourage us, teachers who understand us better, teachers who help us, teachers who are nice, teachers who are fair and teachers who brighten up their lessons. Parker (1999) claimed that good teachers have some sort of connective capacity; they connect themselves to their students. their students to each other,. and everyone to the subject being studied.

One of the important characteristics of effective teachers is taking time to build relationships with students. Malin stated that (1998), "before teachers can be effective they must get to know each student as an individual, as a cultural being, and as a learner" (p. 242). Munns (1998) agreed, "teachers need to recognize that trust and respect are not automatically given" and good teachers "build positive personal and productive pedagogical relationships with students" (p. 173). Malin (1998) indicated that good teachers "contextualize in a way that relates to past and present experiences and knowledge" (p. 244). Taylor, Pearson, Clark and Walpole (2000) found that the most accomplished teachers, in contrast to the least accomplished teachers, had higher pupil engagement, provided smaller group instruction, had a preferred teaching style of coaching as opposed to telling, provided more coaching during reading to help children improve in word recognition and asked more high-level comprehension questions.

Much research strongly supports that successful teachers are thoughtful teachers (Glickman, Gordon & Ross-Gordon, 2001). Hunter (1984) defines teaching as, "the

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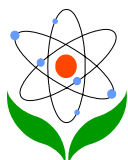Examining elementary science education teachers disposition after reform

constant stream of professional decisions that affects the probability of learning: decisions that are made and implemented before, during, and after interaction with the student" (pp. 169-170). Other researchers, Burden and Byrd (2003) focused on decision-making as the basic teaching skill. Decision-making involves giving consideration to a matter and then selecting the identity, character, scope, or direction of something, making choices, and arriving at a solution that ends uncertainty.

In many universities, teacher preparation programs are now required to specify how teacher candidates are prepared to teach effectively. The U.S. Department of Education and NCATE have encouraged continuing improvement in teacher education based on measured performance (NCATE, 2001). Teacher preparation programs should use assessments of disposition as part of admission procedures (Taylor & Wasicsko, 2000).
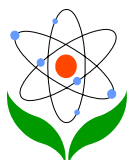
Standards and quality of teachers

Many modern countries define their teacher education standards in the light of their culture and future perspectives. The National Council for Accreditation of Teacher Education (NCATE) and the Interstate New Teacher Assessment and Support Consortium (INTASC) in the US promote this idea. The standards generally provide an operation framework for accredited departments of education in schools around the country. Their mission statements and theoretical framework provide a foundation upon which they build their teacher education programs. The standards for teacher candidates focus on learning outcomes that reflect the knowledge, skills and dispositions of an effective teacher. Teacher candidates are expected to demonstrate knowledge, skills, and dispositions to provide learning opportunities that "support students' intellectual, social and personal development" (NCARE, 2002).

Although many modern countries have educational standards, their student performance clearly suffers. According to results of Organization for Economic Cooperation and Development (OECD) Program for International Student Assessment (PISA) (2003) and the Trends in International Mathematics and Science Study (TIMSS) showed some modern countries, like US and UK and developing countries, like Turkey, Greece, New Zealand, and Mexico are below the average score or around the average score. Thus modern countries have to revise and modify their education system. If we ask why is it that in some countries students could not get good score from PISA and TIMSS, one of the possible

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reasons should be related to teachers' quality. Turkey has taken into consideration the results of these international studies. Turkey ranked 31st among 38 countries in terms of student achievement in math and 33rd in science achievement of eighth graders according to TIMMS results for 1999. The 2003 results of PISA for 15-year-olds showed that, among 38 other countries, thirty-four countries scored above Turkey in mathematics, thirty-three in reading, and thirty-five in science (OECD PISA Country Profiles, 2003). Thus, the Turkish government, as a developing country, concerned about poor students' performance on science topics accompanied by the increasing need for scientific and technological knowledge and skills in order to catch modern countries. The science educators, philosophers and the Ministry of National Education (MoNE) realized that hands-on activities did not apply in schools, and therefore, students had deficiencies in properly understanding the nature of science through an active learning environment and using science concepts that are relevant to their lives, needs and interests. The big educational reform effort was undertaken in 2000 and then it was revised in 2004. According to the MoNE, the purpose of new science curriculum as a part of educational reform is to prepare students to be scientifically literate citizens who are able to use scientific facts in their daily life and gain knowledge about the nature of science and technology, the nature of scientific thinking processes. Additionally, science-technology-society interactions in student-centered teaching approaches should be integrated as alternative measurement and assessment methods (Erdogan, 2005; Yilmaz, Turkmen, & Pedersen, 2008). Firstly, the pilot program was implemented in 9 provinces and 120 primary schools in Turkey during the 2004-05 school year. Then MoNE evaluated the pilot program, so to be ready for complete implementation for next school year. Then, all science teacher educators who had a science education degree were trained by MoNE and then they were offered a brief in-service workshop that lasted 3 days and targeted educational reform for in-service teachers. Even the name of the science course was changed to science and technology in primary education. Meanwhile, university science education programs were changed for pre-service teachers in 2005. Following these changes, an expanded educational reform was initiated in 2005-2006 academic year. According to evaluations of expanded science education reform by Bozyılmaz and Bagcı-Kılıç (2005), and Çakır (2005) scientific knowledge was reduced, while science process skills and science-technology-society connections were emphasized. It can easily be concluded that the main purpose of the current reform is to prepare students to be scientifically literate citizens, who are able to use scientific facts in their daily life, to prepare Turkish teachers to educate accordingly and to encourage

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the use of other teaching approaches based on constructivist theory and inquiry approaches. There is a need to investigate whether or not elementary science teachers are ready to adopt this reform and its ideologies in their lessons (Yilmaz & Turkmen, 2007). The purposes of this study is to measure the characteristic of effective Turkish elementary science teachers and to help them determine if teaching is an appropriate professional fit as specified by the Interstate New Teacher Assessment and Support Consortium.
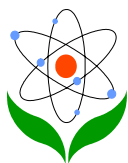
Method

In this study, the Teacher Disposition Index (TDI) questionnaire was distributed to primary school in-service teachers, as a descriptive study. After contacting teachers through face-to-face interaction, mail and email, 161 male and 251 female (total 412) teachers from 72 primary schools participated in the data collection process.

The TDI categorized in Student-Centered Subscale (S) of 25 questions and Professionalism, Curriculum-Centered Subscale *(P)* of 20 questions, was adapted from Schulte et al. (2002). During the adaptation process, guidelines for cross-cultural adaptation were used. Back-translation with bilingual test of the original English instrument, content and construct validity and inter-item correlation were done independently by three experts (Chapman & Carter, 1979). After this process, three experts decided on the Turkish version and then the pilot study and the questionnaire were applied. A five-point Lickert scale, ranging from 1, for strongly disagrees, to 5, for strongly agrees, was used. The TDI took approximately 15 minutes to complete.

There were found a significant correlation at 0.05 levels (2 tailed). The Kaiser-Meyer-Olkin (KMO) measures the sampling adequacy which should be greater than 0.5 for a satisfactory factor analysis to proceed. The KMO measure was 0.97 and the Bartlett's test of sphericity is significant (table 1).

Table 1: *Conformation factor analysis:*

Model	c2	df	c2 / df	Goodness of Fit Index (GFI)	Comparative Fit Index (CFI)	RMSEA
				0.81	0.98	0.069
Normal value: P-Value for Test of Close Fit (RMSEA < 0.05) = 0.00						

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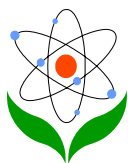Examining elementary science education teachers disposition after reform

Its associated probability is less than 0.05. This means that the correlation matrix is not an identity matrix. Moreover, according to measuring the Cronbach alpha the reliability for the 20-questions regarding the professionalism/curriculum-centered scale was 0.94, and for the 25-item of student-centered questions was 0.95. These results gave us permission to continue with factor analyzing. While exploratory factor analysis is useful in revealing the empirical structure of TDI items, the confirmatory factor analysis (CFA) is a statistical technique that provides a means of assessing how well a proposed theoretical model fits a set of data by examining patterns of covariance in the data. The CFA specifies what TDI items load onto underlying factors (INTASC's ten principles), and the relationship between these factors. CFA has GFI (goodness of fit) and CFI (comparative fit index) indicating how much better the INTASC's ten principles (see appendix A) fits the data. Their values can range between 0 and 1 with higher values indicating a better fit. A value above .9 represents a reasonable fit. The RMSEA (root mean square error of approximation) is better conceived of as an index of inappropriateness of fit. If the RMSEA value is below .1 is good, it indicates a reasonable error of approximation (Browne and Cudeck 1993).

In this study, after factor analyzing, the TDI items were categorized into seven INTASC's principles, which are 1, 2, 3, 5, 6, 7, and 9.

Results an analysis

The results showed that in-service teachers are aware of the importance of students' motivation to meaningfully learn and to teach knowledge to stimulate students' motivation during lessons. They can make a connection between subject and activities and students' experience. On the other hand, selecting materials relevant and interesting for students is difficult for them. They are not sure how to select useful materials for their lessons indicated by the low mean score in the principle 1 (table 2). Materials are core center of inquiry. Teachers must provide students with opportunities to develop the abilities and understandings of scientific inquiry. The reason this behavior is low might be due to the fact that teachers do not do enough observation of their students in order to learn about them, what they can do, can almost do, or cannot do. If you don't know your students, you cannot select proper and interesting materials that students like. According to Piaget, teachers have to first know their students, instruct their lessons be around students' current abilities and then allow students freedom to learn in their own ways under control of teacher (Abd-El-Khalick, & Lederman, 2000; Anderson, 2002; Bybee & Sund, 1990)

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Table 2. *Principle 1: Knowledge of Subject Matter*

	Mean	SD	D	ND NA	A	SA	Factor Loading	
							F1	F2
P5. I stimulate students' interests.	4.00	2	4	101	176	125	0.406	0.765
P8. I select material that is relevant for students.	3.68	2	3	145	216	41	0.412	0.678
P13. I select material that is interesting for students.	3.59	2	6	173	206	23	0.366	0.590
P16. I create connections to subject matter that are meaningful to students.	4.34	2	3	27	231	147	0.377	0.602
* α: 0.80, SD: Strongly disagree, D: Disagree, ND NA: Neither Disagree Nor Agree, A: Agree, SA: Strongly agree								

Teachers believe they have to use different learning strategies and create warm learning environment in order to teach students, but they are not sure that every student can learn and teachers confuse their needs. Every student is unique, and different students have different needs. Teachers have to understand how children differ in their development and approach to learning. Then, they should be able to adapt strategies and environments to meet specific needs of children. The first duty of teacher is to assess each student's developmental levels and abilities in all areas and match learning environments and experiences appropriately (Bybee & Sund, 1990). Without such information, a teacher is unaware of students' learning problems and proper feedback cannot be given to help encourage students in their social and personal development (table 3).
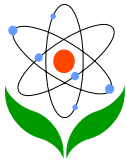
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Table 3. *Principle 2: Knowledge of Human Development & Learning*

	Mean	SD	D	ND NA	A	SA	Factor Loading	
							F1	F2
S1. I believe a teacher must use a variety of instructional strategies to optimize student learning.	4.45	5	8	28	167	202	0.765	0.386
S6. I believe that all students can learn.	3.10	11	83	156	84	56	0.698	0.422
S8. I believe the classroom environment a teacher creates greatly affects students' learning and development.	4.21	3	4	89	120	194	0.678	0.394
S12. I understand students have certain needs that must be met before learning can take place.	3.17	10	140	127	84	59	0.588	0.387
S17. I believe it is my job to create a learning environment that is conducive to the development of students' self-confidence and competence.	4.02	3	3	122	136	146	0.745	0.416
P14. I provide appropriate feedback to encourage students in their development.	3.65	2	22	178	125	83	0.404	0.801
* α:0.68								

There are wide differences between students and the skills they bring to classroom. Teachers must know to create instructional opportunities that help to use all students' understanding, because students learn in a many different ways. The classroom environment then becomes a learning environment in which individual differences are respected by each one. Although most of Turkish in-service teachers know theoretically that every student is special and coming from different social status and cultures, their scores in S13 and P9 related to students' differences and facilitating learning for all students are low. There are some different approaches for dealing with individual differences among students. Generally, the solution is the teacher, and the teacher should develop events of instruction that use groups as part of the instructional process (Leithwood, 1990; Malin, 1998; Sederberg, & Clark, 1990). It seems that teachers in this study are less likely to do that (table 4).
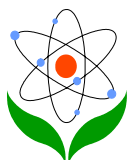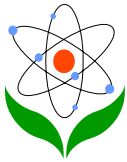
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Table 4. *Principle 3: Adapting Instruction for Individual Needs*

	Mean	SD	D	ND NA	A	SA	Factor Loading	
							F1	F2
S2. I understand that students learn in a many different ways. (P3)	4.02	4	5	126	117	158	0.755	0.406
S7. I believe it is important to involve all students in learning.	4.33	4	5	59	180	162	0.688	0.412
S10. I understand that teachers' expectations impact student learning.	4.04	4	34	92	171	109	0.678	0.366
S13. I am sensitive to student differences.	3.63	3	54	137	114	102	0.598	0.377
S18. I respect the cultures of all students.	4.02	3	5	109	158	135	0.705	0.399
P9. I am successful in facilitating learning for all students	3.55	3	8	234	90	75	0.329	0.663
* α:0.74								

According to the results of Table 5, in-service teachers know how to engage individually as well as with groups of students. When doing so, they demonstrate high moral behaviors such as empathy, respect and patience in a learning environment that encourages and supports positive social interaction for every student (Table 5).

Table 5. *Principle 5: Classroom Motivation and Management*

	Mean	SD	D	ND NA	A	SA	Factor Loading	
							F1	F2
S3. I demonstrate qualities of humor. empathy. and warmth with others.	4.17	3	4	123	154	126	0.744	0.396
S20. I treat students with dignity and respect at all times.	4.04	4	34	92	171	109	0.728	0.312
S22. I am patient when working with students.	4.23	3	2	69	196	140	0.778	0.405
P10. I demonstrate and encourage democratic interaction in the classroom and school.	4.00	2	4	101	177	124	0.468	0.764
* α:0.80								

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A communication skill set is another important asset in being effective teacher. Good communications (generally meaning good eye-contact, usage and understanding body language, speaking loudly, and overall practice) skills are special qualities that every teacher should possess. Teaching has placed a strong emphasis on basic communication skills. Although most of Turkish in-service teachers are responsive listeners, they have problem with nonverbal communication skills, they are not good with understanding students' body language. Indeed, body language speaks what you don't speak. The in-service teachers seem to communicate with students about the science concept without caring and concern. One possible reason is that teachers do not enough have personal information about their students because of crowded classrooms (Table 6).

Table 6. *Principle 6: Communication Skills*

	Mean	SD	D	ND NA	A	SA	Factor Loading	
							F1	F2
S4. I am a thoughtful and responsive listener.	4.45	4	4	26	197	179	0.765	0.335
S14. I communicate caring. concern. and a willingness to become involved with others.	3.50	4	3	126	155	122	0.698	0.400
P11. I accurately read the non-verbal communication of students.	3.41	2	53	190	107	58	0.348	0.689
* α:0.70								

The results showed that teachers have instructional planning skills. It means that a teaching plan is prepared inclusively, cooperatively and differentiated according to students' needs. Then, plans are shared with colleagues. Their plans are also for both long-term and short-term planning and they are flexible when considering national content standards within context (Abd-El-Khalick, & Lederman, 2000; Anderson, 2002; Bozyilmaz, & Bagci-Kilic, 2005). Hence, they can work in many ways to build a positive environment to develop systems for overseeing their classrooms so that the focus is on learning, not on controlling student behavior (Table 7). It is accurate to say that new reform efforts affected teachers' point of view, and created a constructivist perspective in education after taking in-service workshop. Didactic teaching and traditional teacher behaviors have slowly been replaced (Bozyilmaz, & Bagci-Kilic, 2005).
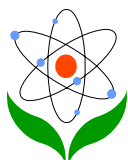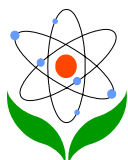
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Table 7. *Principle 7: Instructional Planning Skills*

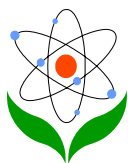|	Mean	SD	D	ND NA	A	SA	Factor Loading	
							F1	F2
S5. I assume responsibility when working with others.	4.63	2	5	11	163	229	0.644	0.396
S11. I view teaching as a collaborative effort among educators.	4.39	6	5	30	198	171	0.748	0.355
S23. I am open to adjusting and revising my plans to meet student needs.	4.33	3	3	42	200	163	0.759	0.410
S25. I believe it is important to learn about students and their community.	4.02	4	34	82	181	109	0.718	0.312
P2. I cooperate with colleagues in planning instruction.	4.04	3	8	80	201	118	0.381	0.727
P6. I value both long term and short term planning.	4.17	3	4	52	220	141	0.302	0.787
P17. I listen to colleagues' ideas and suggestions to improve instruction.	4.45	4	4	26	197	179	0.432	0.762
P20. I work well with others in implementing a common curriculum.	4.29	2	4	26	218	160	0.396	0.738
* α:0.86								

Turkish in-service teachers are not sure how to critically examine their practice, deepen their knowledge, adapt their teaching to new findings, ideas and theories based on current research. learn new ways to make lesson plans, have the ability to constantly self-evaluate and act critically and manage a classroom. The definition of a teacher has completely changed from past definitions. S/he is not just a person teaching. A teacher has to improve his/her professional skills in teaching. That means one has the ability to learn as much from his/her students as s/he learns from his/her colleagues and other sources. S/he has to evaluate his or her teaching skills which are the mark of a reflective practitioner in the classroom. Such self-reflection leads to greater knowledge about students, the subject being taught and the strength of teaching. Self-reflection also affects relationships with students and students' parents. Moreover ethical behavior is also important to integrate teacher professional growth. S/he should aware of students' cultural events and special days and try to integrate these events into science curriculum. In addition

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teachers have to read current news, journal articles, books (Abd-El-Khalick, & Lederman, 2000; Anderson, 2002). Poor communication with students, parents, and colleagues involves a lack of professionalism. The key to communicating effectively is to continually communicate. Often it is about solving problems rather than avoiding them. Teachers should start from the first day of school and keep everyone informed throughout the year. Turkish in-service teachers actively do not seek enough out opportunities to grow professionally. Thus if you hesitate on how to do that. you cannot professionally grow (Table 8).

Table 8. *Principle 9: Professional Commitment and Responsibility*

	Mean	SD	D	ND NA	A	SA	Factor Loading	
							F1	F2
S9. I view teaching as an important profession.	4.04	4	34	92	171	109	0.726	0.381
S15. I am punctual and reliable in my attendance.	4.51	4	3	22	162	219	0.785	0.302
S16. I maintain a professional appearance.	3.10	11	83	156	84	56	0.764	0.232
S19. I honor my commitments.	4.49	3	4	10	168	225	0.728	0.496
S21. I am willing to receive feedback and assessment of my teaching.	4.18	3	2	125	101	179	0.727	0.351
S24. I communicate in ways that demonstrate respect for the feelings. ideas. and contributions of others.	4.42	4	3	13	208	183	0.717	0.382
P1. I am committed to critical reflection for my professional growth.	3.21	3	103	144	126	34	0.311	0.627
P3. I actively seek out professional growth opportunities.	3.37	3	53	150	113	71	0.302	0.737
P4. I uphold the laws and ethical codes governing the teaching profession.	3.49	1	62	167	96	84	0.332	0.742
P7. I stay current with the evolving nature of the teaching profession.	4.28	2	6	62	209	130	0.496	0.733
P12. I engage in discussions about new ideas in the teaching profession.	3.96	2	6	134	134	134	0.359	0.717

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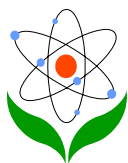|							
P15. I engage in research-based teaching practices.	3.27	52	110	170	80	48	0.372	0.778
P18. I take initiative to promote ethical and responsible professional practice.	3.37	3	52	152	112	71	0.386	0.760
P19. I communicate effectively with students. parents. and colleagues.	3.45	12	55	172	84	88	0.314	0.743
α:0.92							

Discussion and conclusion

We may never solve the poor quality teaching problems unless more attention is paid to the dispositions and characteristics that impact classroom practice. The reality is that in-service teachers do not have qualified professional skills to solve these problems, and even new teachers do not feel ready for the challenges of today's classrooms. The TDI has many potential uses for teachers and teacher preparation programs. If we integrate TDI in our teacher preparation programs, our pre-service teachers may become increasingly aware of the characteristics of effective teachers, and they may be able to apply, observe, and reflect on these traits throughout the teacher preparation process. The TDI allows in-service teachers to evaluate themselves and their work, and then determine whether or not additional steps are needed to improve their teaching skills. That understanding may help constructively change attitudes and behaviors and possibly to improve schools.

This study is descriptive study which is self-evaluation report was determined via teachers thoughts, and showed that Turkish elementary science teachers are not failing, except they have some doubts regarding their skills. The first doubt is they are not sure how to maintain and develop their professional skills. They are not seeking out professional growth opportunities, especially not following up current research on teaching practices. Moreover, they have ethical and communication problems with students and parents and their colleagues. Before their lesson, they might not make decisions about the selection of proper (relevant and interesting for students) materials for lesson. Another possible reason for these deficiencies might be related to the three P's, which are psychology, philosophy, and pedagogy, for the design of science curriculum that supports both student learning, teachers' assessments and teachers' professional development (Abd-El-Khalick, & Lederman,

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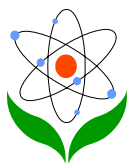Examining elementary science education teachers disposition after reform

2000). In-service teachers do not know students psychologically, pedagogically and philosophically. That is, they cannot consistently emphasize their love, not understand the student's personality, likes, dislikes, and personal situations that may affect behavior and performance in class, not use opportunities at school and out of school to open communication lines and not regard the ethic of care and learning as important in educating students, because of a lack of integration and mutual influence derives from inherent incompatibilities between the goals and methods of science teaching in classrooms. Teachers were typically not interested in how to teach children to think more scientifically (Klahr & Li, 2005; Metz 1997). Wilson, Floden and Ferrini-Mundy (2001) declared teachers who focused generally on pedagogical content knowledge on science subject matter significantly improved student achievement. Turkish in-service teachers not only teach basic science concepts, but also have to prepare their students for national exams at the end of the primary school in order to advance to special schools or high school and eventually university. A lack of materials and deficiencies in the physical environment, including crowdedness of classrooms, cause difficulties. These might be reasons why they just focus science concepts; hence, they are not able to update their teaching and professional skills.

Limitation

This study is just a descriptive study to see what they think. Methodologically, the assumption underlying the survey instrument is that all respondents will answer truthfully and with integrity. For some reason, however, teachers may respond with right answers rather than in terms of what they are actually doing in their lessons.
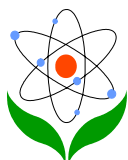
Suggestions

Turkish in-service teachers should be guided to identify and understand their traits through workshops and in-services trainings. Next, research about teaching characteristics should be done via the self-reported data and observation of what teachers doing to eliminate bias. Moreover, the government's next duty is to modify the teacher training programs at the university level. Academicians should examine their own teaching skills so that a frank discussion with their students can lead to appraisal of useful and constraining characteristics. Academicians and students should analyze characteristics expressed in a variety of activities including, small group discussions, problem solving dialogue, lesson plan assessment, etc. In

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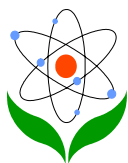Examining elementary science education teachers disposition after reform

every course students and the teacher should have opportunities to examine attitudes and beliefs about subject matter in order to become reflection of habit of mind. After all these changes, Turkish education reform would succeed within a few years.

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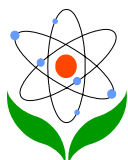Schulte, L. E., Thompson, F., Talbott, J., Luther, A., Garcia, M., Blanchard, S., Conway, L., & Mueller, M. (2002). The development and validation of the ethical climate index for middle and high schools. *The School Community Journal, 12*(2), 117-132.

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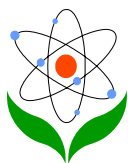
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Appendix A - INTASC principles

Principle 1: The teacher understands the central concepts. tools of inquiry. and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.

Principle 2: The teacher understands how children learn and develop and can provide learning opportunities that support their intellectual. social. and personal development.

Principle 3: The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.

Principle 4: The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking. problem solving. and performance skills.

Principle 5: The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction. active engagement in learning. and self-motivation.

Principle 6: The teacher uses knowledge of effective verbal. nonverbal. and media communication techniques to foster active inquiry. collaboration. and supportive interaction in the classroom.

Principle 7: The teacher plans instruction based upon knowledge of subject matter. students. the community. and curriculum goals.

Principle 8: The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual and social development of the learner.

Principle 9: The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students. parents. and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

Principle 10: The teacher fosters relationships with school colleagues. parents. and agencies in the larger community to support students' learning and wellbeing.